UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/659,066	09/09/2003	Brad Calder	0321.68199	3820

			EXAMINER
24978	7590	07/27/2006	STEELMAN, MARY J

GREER, BURNS & CRAIN
300 S WACKER DR
25TH FLOOR
CHICAGO, IL 60606

ART UNIT	PAPER NUMBER
2191	

DATE MAILED: 07/27/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

PTO-90C (Rev. 10/03)

	Application No.	Applicant(s)
Office Action Summary	10/659,066	CALDER ET AL.
	Examiner	Art Unit
	Mary J. Steelman	2191

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
  Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on <u>9/9/03, 2/5/04, 7/22/05</u>.

2a)☐ This action is **FINAL.**   2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) <u>1-53</u> is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) <u>1-53</u> is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on <u>09 September 2003</u> is/are: a)☒ accepted or b)☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☐ All b)☐ Some * c)☐ None of:

      1.☐ Certified copies of the priority documents have been received.

      2.☐ Certified copies of the priority documents have been received in Application No. _____.

      3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1)☒ Notice of References Cited (PTO-892)

2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3)☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
    Paper No(s)/Mail Date <u>7/22/05</u>

4)☐ Interview Summary (PTO-413)
    Paper No(s)/Mail Date. _____ .

5)☐ Notice of Informal Patent Application (PTO-152)

6)☐ Other: _____ .

DETAILED ACTION

1.   Claims 1-53 are pending.

Information Disclosure Statement

2.   IDS received 22 July 2005 has been considered.

Claim Rejections - 35 USC § 112

3.   The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4.   Claims 12 (and dependent claims 13-21 & 26), 41, 42 and 47 (and dependent claims 48-53) are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

5.   The term "more likely to be similar" in claim 12 is a relative term which renders the claim indefinite. The term "more likely to be similar" is not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention.

6.   Claim 41 recites the limitation "to a lower number of buckets". There is insufficient antecedent basis for this limitation in the claim.

7.   Claim 42 recites the limitation "a previous section of code in a history". There is insufficient antecedent basis for this limitation in the claim.)Additionally, the logic of claim 42 is confusing. Adding the previous section of code to the history, when it is already in the history, is confusing.)

8.   The term "is not similar" in claim 42 is a relative term which renders the claim indefinite. The term "is not similar" is not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention.

9.   The term "an approximate match" in claim 47 is a relative term which renders the claim indefinite. The term "approximate" is not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention.

Claim Rejections - 35 USC § 101

10.   35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

11.   Claims 1-43 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter.

It appears to Examiner that claim limitations fail to produce a result that is useful, concrete and tangible. As an example, claim 1 recites "running code", "tracking a statistic", "identifying a behavior" and "comparing". Amending the claim limitations to physically store the statistics or the results of a comparison identified during an analysis of a computer program would provide a 'useful, concrete and tangible' result. (Note that claims 44-53 result in 'retaining'/storing the vector, thus providing a 'useful, concrete and tangible' transformation.)

See:

2106 [R-3] Patentable Subject Matter — Computer-Related Inventions

I. INTRODUCTION

These Examination Guidelines for Computer-Related Inventions ("Guidelines") are to

assist Office personnel in the examination of applications drawn to computer-related

inventions. "Computer-related inventions" include inventions implemented in a computer

and inventions employing computer-readable media. The Guidelines are based on the

Office's current understanding of the law and are believed to be fully consistent with

binding precedent of the Supreme Court, the Federal Circuit and the Federal Circuit's

predecessor courts.

These Guidelines do not constitute substantive rulemaking and hence do not have the

force and effect of law. These Guidelines have been designed to assist Office personnel in

analyzing claimed subject matter for compliance with substantive law. Rejections will be

based upon the substantive law and it is these rejections which are appealable.

Consequently, any failure by Office personnel to follow the Guidelines is neither

appealable nor petitionable.

The Guidelines alter the procedures Office personnel will follow when examining

applications drawn to computer-related inventions and are equally applicable to claimed

inventions implemented in either hardware or software. The Guidelines also clarify the

Office's position on certain patentability standards related to this field of technology.

Office personnel are to rely on these Guidelines in the event of any inconsistent treatment

of issues between these Guidelines and any earlier provided guidance from the Office.

Office personnel should no longer rely on the Freeman-Walter-Abele test to determine

whether a claimed invention is directed to statutory subject matter. State Street Bank &

Trust Co. v. Signature Financial Group Inc., 149 F. 3d 1368, 1374, 47 USPQ2d

1596, 1601-02 (Fed. Cir. 1998) ("After Diehr and Chakrabarty, the Freeman-Walter-

Abele test has little, if any, applicability to determining the presence of statutory subject

matter.").

Office personnel have had difficulty in properly treating claims directed to methods of

doing business. Claims should not be categorized as methods of doing business. Instead,

such claims should be treated like any other process claims, pursuant to these Guidelines

when relevant. See, e.g., State Street, 149 F.3d at 1374-75, 47 USPQ2d at 1602 (Fed.

Cir. 1998); In re Toma, 575 F.2d 872, 877-78, 197 USPQ 852, 857 (CCPA 1978); In

re Musgrave, 431 F.2d 882, 893, 167 USPQ 280, 289-90 (CCPA 1970). See also In

re Schrader, 22 F.3d 290, 297-98, 30 USPQ2d 1455, 1461-62 (Fed. Cir. 1994)

(Newman, J., dissenting); Paine, Webber, Jackson & Curtis, Inc. v. Merrill Lynch,

Pierce, Fenner & Smith, Inc., 564 F. Supp. 1358, 1368-69, 218 USPQ 212, 220 (D.

Del. 1983).

The appendix which appears at the end of this section includes a flow chart of the

process Office personnel will follow in conducting examinations for computer-related

inventions.

II. DETERMINE WHAT APPLICANT HAS INVENTED AND IS SEEKING

TO PATENT

It is essential that patent applicants obtain a prompt yet complete examination of their

applications. Under the principles of compact prosecution, each claim should be

reviewed for compliance with every statutory requirement for patentability in the initial

review of the application, even if one or more claims are found to be deficient with

respect to some statutory requirement. Thus, Office personnel should state all reasons

and bases for rejecting claims in the first Office action. Deficiencies should be explained

clearly, particularly when they serve as a basis for a rejection. Whenever practicable,

Office personnel should indicate how rejections may be overcome and how problems

may be resolved. A failure to follow this approach can lead to unnecessary delays in the

prosecution of the application.

Prior to focusing on specific statutory requirements, Office personnel must begin

examination by determining what, precisely, the applicant has invented and is seeking to

patent, and how the claims relate to and define that invention. (As the courts have

repeatedly reminded the Office: "The goal is to answer the question What did applicants

invent?'" In re Abele, 684 F.2d 902, 907, 214 USPQ 682, 687. Accord, e.g.,

Arrhythmia Research Tech. v. Corazonix Corp., 958 F.2d 1053, 1059, 22 USPQ2d

1033, 1038 (Fed. Cir. 1992).) Consequently, Office personnel will no longer begin

examination by determining if a claim recites a "mathematical algorithm." Rather they   will

review the complete specification, including the detailed description of the invention, any

specific embodiments that have been disclosed, the claims and any specific, substantial,

and credible utilities that have been asserted for the invention.

A. Identify and Understand Any Practical Application Asserted for the Invention

The claimed invention as a whole must accomplish a practical application. That is, it must

produce a "useful, concrete and tangible result." State Street, 149 F.3d at 1373, 47

USPQ2d at 1601-02. The purpose of this requirement is to limit patent protection to

inventions that possess a certain level of "real world" value, as opposed to subject matter

that represents nothing more than an idea or concept, or is simply a starting point for

future investigation or research (Brenner v. Manson, 383 U.S. 519, 528-36, 148

USPQ 689, 693-96); In re Ziegler, 992, F.2d 1197, 1200-03, 26 USPQ2d 1600,

1603-06 (Fed. Cir. 1993)). Accordingly, a complete disclosure should contain some

indication of the practical application for the claimed invention, i.e., why the applicant

believes the claimed invention is useful.

Claim Rejections - 35 USC § 102

12.   The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the

basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

13.   Claims 1-17, 22-33, 35-40, 42-48, 50, and 52 are rejected under 35 U.S.C. 102(b) as

being anticipated by USPN 5,699,507 to Goodnow, II et al.

Per claim 1:

A method of analyzing a computer program, the method comprising:

-running code of the computer program over a plurality of intervals of execution;

Goodnow: Col. 8: 62-63, "the program is run so that the dynamic attributes may be extracted (step 215)", col. 10: 11-25, "The data structure identifies each function (a plurality of intervals) which is executed and determines the properties of the other function which will be executed...Each row and column represents a particular function. A function corresponds to a particular collection of blocks. The number identified in each space indicated the probability that a given function will transition to another given function..."

-during said step of executing code, tracking a statistic for a program component;

Goodnow: Col. 8, lines 63-66, "the program is run so that the dynamic attributes may be extracted (step 215)...may include...control flow and data flow analysis."

-identifying a behavior of the computer program over each of the plurality of intervals of execution based on the tracked statistic;

Goodnow: Col. 10, see Table 7 and text at col. 10: 11-25, "The data structure identifies each function (plurality of intervals) which is executed and determines the properties of the other function which will be executed...probability that a given function will transition (behavior)..."

-comparing at least one identified behavior for at least one interval of execution to another interval of execution to determine similarity between the intervals of execution.

Goodnow: Table 6 & Col. 9: 11-26, "This data structure identifies each block (of an interval / function) which is executed and determines the properties of the other block which will be executed...indicated the probability that a given block will transition...It is to be understood by

those skilled in the art that the above data structure b_dynamic.ctrl is an exemplary history

matrix which may be used to represent the data and that the data can be formatted in various

ways..." Col. 4, lines 39-41, "Similarity measurements are performed between two or more

code segments to identify how closely related the two code segments are for some defined set of

properties."

Per claim 2:

-at least one of executing the program on hardware, simulating the program's execution in

software, direct execution, emulating the program's execution in software, and modeling a

hypothetical execution in software.

Goodnow: Col. 7: 29-32, "The types of operators identified in the program...were determined

by observing how each of the operations is performed in hardware and then making a

determination of which hardware operations are similar to one another."

Per claim 3:

-the statistic comprises at least one of a hardware metric and a hardware-independent metric.

Goodnow: Col. 7: 29-32.

Per claim 4:

-the statistic comprises at least one of frequency of the component occurring in execution,

number of instructions executed, amount of memory used by the program component, time, IPC,

performance counters, program counters, and cache miss rate.

Goodnow: Col. 3: 1-12, "information about variables, operators, control flow and data flow",

col. 6: 39, "number of occurrences of each identifier types", col. 7: 20, "number of occurrences

of a given parameter", col. 8: 31, "number of occurrences of each operator", col. 8: 45-61,

"number of occurrences of that particular identifier or operator in that function".

Per claim 5:

-the program component comprises an identifiable section of control flow of the computer

program.

Goodnow: Col. 8: 64, "control flow", col. 3, 6-8, "Control flow information generally includes a

history of every file name and line number which has been visited."

Per claim 6:

-the program component comprises at least one of an instruction, basic block, procedure, loop,

load instruction, and branch instruction.

Goodnow: Col. 7: 26, col. 14: 63-64, Also see code sample at col. 3: 23.

Per claim 7:

-the program component comprises a memory region.

Goodnow: Col. 2: 37-39

Per claim 8:

-the program component comprises a basic block, the basic block being a section of the code

having a single entry point and a single exit.

Goodnow: Col. 8:56, col. 9: 11-26, Also see code sample at col. 3: 23.

Per claim 9:

-each of the plurality of intervals of execution comprises at least one of a time interval, an

instruction interval, and a metric-based interval.

Goodnow: Col. 3: 9-12- data flow information recorded, Col. 10: 12-25,

Per claim 10:

-one of the plurality of intervals comprises the execution of at least one of the subset of the code

and the full execution of the code.

Goodnow: Col. 8: 62-63- entire program is executed, including all function intervals.

Per claim 11:

-the intervals of execution comprise at least one of overlapping and non-overlapping intervals.

Goodnow: Col. 9: 28-30, Table 7 & col. 10: 12-26

Per claim 12:

-based on said comparing step, classifying the plurality of intervals of execution into at least one

cluster,

Goodnow: Col. 11: 30-39.

-wherein each of the intervals is more likely to be similar in program behavior to the other

intervals in that cluster than to the intervals in a remainder of clusters.

Goodnow: col. 11: 50-64. Using the matrix tables the data points are clustered in an interface.

Per claim 13:

-selecting at least one representative interval of execution for each of the at least one cluster.

Goodnow: Col. 13: 8-12, FIG. 3, #325, Col. 13: 37,

Per claim 14:

-each of the at least one representative interval of execution is closest to an average behavior of

the cluster.

Goodnow: Col. 13: 48-50, "distance measurement and indicate the degree of similarity relative

to the other code segments...", col. 4: 39-41, "Similarity measurements are performed between

two or more code segments to identify how closely related the two code segments are for some

defined set of properties."

Per claim 15:

-the representative interval of execution is the earliest interval of execution within a

predetermined distance from an average behavior of the cluster.

Goodnow: Col. 3: 5-12.

Per claim 16:

-weighing each of the selected representative intervals of execution based on at least one of a

total amount of time, a number of instructions within the cluster, the program component, and

the statistic.

Goodnow: Col. 13: 17-36.

Per claim 17:

-the weighted representative intervals collectively represent a complete execution of at least a

subset of the computer program.

Goodnow: Col. 9: 11, col. 10: 12, col. 8: 62-63.

Per claim 22:

-comparing each interval to the interval of execution representing at least a subset of execution

of the computer program.

Goodnow: Col. 11: 31-36.

Per claim 23:

-based on said comparing step, identifying an end of an initialization of the computer program.

Goodnow: Col. 11: 61-64, col. 5: 16, col. 8: 61-62.

Per claim 24:

-based on said comparing step, identifying a length of at least one repeating interval of

execution.

Goodnow: Col 12: 49.

Per claim 25:

-identifying a length comprises performing an analysis of a signal, the signal comprising

differences between each identified interval of execution and the interval of execution

representing the at least a subset of execution of the computer program.

Goodnow: Col. 11: 54-58.

Per claim 26:

-determining a confidence and variance by sampling the intervals of execution within a particular

cluster for at least one of a hardware metric and a hardware-independent metric.

Goodnow disclosed (Col. 2: 48-51, 58-61 & 65-66) a distance matrix generator 115 receives the

information from the statistical generator 10 and identifies similarities...as a function of a

weighing scheme (confidence and variance)...,an interface generator generates an interface such

as, but not limited to, a cluster interface or dot plot matrix, which is based on the generated

distance matrices. Predefined metrics which include both static and dynamic characteristics are

considered in identifying similarities in two or more code segments.

Per claim 27:

A method of analyzing a computer program, the method comprising:

-running at least a portion of the computer program;

Goodnow: Col. 8: 62.

-identifying behavior of a hardware-independent metric within at least one arbitrary section of execution of the portion of the computer program during said executing step;

Goodnow: Col. 8: 62-66.

-classifying each of the at least one arbitrary section of execution according to the identified behavior into clusters of similar behavior.

Goodnow: Col. 9: 24-26 – history matrix is used in generating a (col. 2: 60) cluster interface / dot plot matrix.

Per claim 28:

-identifying a frequency of execution of basic blocks of the executed code,

Goodnow: Col. 8: 55-56.

-wherein each of the at least one basic block comprises a piece of code of the computer program executed from start to finish, said basic block having only one entry point and one exit.

Goodnow: Col. 9: 11-26 Also see rejection of claim 8 above.

Per claim 29:

-identifying a frequency provides a group of frequencies for each of the number of intervals.

Goodnow: Col. 9: 24 (history matrix).

Per claim 30:

-comparing the identified behavior of one of the intervals to the identified behavior of another of

the intervals to identify a phase of the interval.

Goodnow: Col. 9: 24-26 A history matrix identifies the behavior of the functions and a phase

transition to another function. See Table 7 for function transitions.

Per claim 31:

-identifying an initialization phase;

Goodnow: See rejection of claim 23 above.

-determining at least one analysis point occurring after execution of the identified initialization

phase.

Goodnow: Col. 13: 37-40 Compare function similarities.

Per claim 32:

-for each of the number of intervals, determining a interval vector, the interval vector comprising

a plurality of ordered elements, each of the plurality of ordered elements relating to a particular

basic block and representing a frequency of execution of the particular basic block.

Goodnow: Col. 8: 53, col. 9: 11-26.

Per claim 33:

-partitioning the computer program into a set of clusters by comparing the determined interval

vectors to one another.

Goodnow: Col. 9: 27 – create f_dynamic.ctrl & use data sets to create a cluster interface (col. 2:

60).

Per claim 35:

A method of analyzing operation of a computer program, the method comprising:

-executing at least a portion of the computer program;

-for each of a plurality of intervals of execution over the at least a portion of the computer

program, identifying behavior of a hardware-independent metric;

-identifying behavior of the hardware-independent metric over full execution of the at least a

portion of the computer program to identify a target behavior;

-comparing the identified behavior of each of the plurality of intervals to the identified target

behavior over full execution to determine a representative interval;

-simulating execution of the computer program over the determined representative interval.

Goodnow: Col. 8: 62-67. Also see rejection of claim 1 above. Goodnow (col. 2:65-67)

disclosed "predefined metrics which include both static and dynamic characteristics are

considered in identifying similarities in two or more code segments."

Per claim 36:

-deriving a plurality of basic block vectors, each basic block vector representing code blocks of

the program executed during the interval of execution, the basic block vector being based on

frequencies of basic blocks of executed code within execution of the program;

-wherein the basic block vector comprises a single dimensional array where a single element in

the array exists for a basic block in the program.

Goodnow: Col. 14: 63-64, col. 9: 11-13. See Table 6-"identifies each block which is

executed..."

Per claim 37:

-the method is performed in run-time.

Goodnow: Col. 8: 62-67.

Per claim 38:

-identifying comprises tracking a proportion of instructions executed from different sections of

code of the program over each of the plurality of intervals; further comprising, for each interval,

classifying the identified behavior into phases corresponding to changes in behavior across the

executed code.

Goodnow: See Tables 6 (basic blocks) & 7 (functions / phases). Table 7 shows (col. 10: 20) that

a given function will transition to another given function (to another phase).

Per claim 39:

-predicting when execution of the code is about to enter a phase change; predicting a phase

entered by the phase change.

Goodnow: Table 7 shows (col. 10: 20) that a given function will transition (about to enter) to

another given function (to another phase).

Per claim 40:

-for each section of code: capturing an identifier of the section of code;

-capturing a number of instructions executed for the section of code.

Goodnow: See example at Table 6 (block number). Table 8 & related text at col. 11: 13-40,

"indicates when an identifier has been referenced."

Per claim 42:

-comparing each section of code to a previous section of code in a history;

-if the compared section of code is not similar to the previous section of code, adding the

previous section of code to the history.

Goodnow: Col. 9: 22-26 discloses a history matrix. Col. 2: 42-43, "The statistical extractor 110

extracts predefined data attributes from each code segment", col. 11: 21 history.

Per claim 43:

-the behavior identified for an interval is collected in a vector, the vector containing the statistic

for at least one element representing at least one component.

Goodnow: Col. 10: 17-21.

Per claim 44:

-the vector is retained in at least one of a memory, a storage medium, and a table.

Goodnow: See Table 7 at column 10.

Per claim 45:

-the vector is stored as a signature that represents at least one of the behavior of a complete

vector, a projection of the vector, a compressed representation of the vector, a partial

representation of the vector, and a subset of the behavior identified collected in the vector.

Goodnow: Table 7 Col. 10: 1-21 & Col. 11: 57.

Per claim 46:

-storing a phase ID with the signature, wherein the phase ID comprises at least one of a complete

signature, a subset of the signature, a partial representation of the signature, a name independent

of the signature, and a number.

Goodnow: Col. 11: 57 (signatures)

Per claim 47:

-the stored phase ID is identified for an interval by at least one of looking up the signature in

storage, and if an approximate match exists, using the phase ID stored with the signature, and

creating a new phase ID.

Goodnow: See Tables 7 & 8. Table 7 shows functions transitioning to another given function

(phases). Table 8 identifies identifiers modified or reverenced.

Per claim 48:

-the identified behavior and the tracked statistic for at least one interval with a phase ID are

stored and associated with one another.

Goodnow: See related Tables 7 & 8.

Per claim 50:

-after the phase ID is identified by a signature for an interval: looking up the phase ID to find the

associated statistic for the interval.

Goodnow provided for (col. 2: 65-66) "metrics which include both static and dynamic

characteristics are considered in identifying similarities in two or more code segments" using a

dot plot matrix or cluster interface.

Per claim 52:

-the phase ID is stored in a prediction table,

-and further comprising: predicting a phase ID for an interval using the stored phase ID.

Goodnow: Col. 10: 19.

Claim Rejections - 35 USC § 103

14.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

15.   Claim 34 is rejected under 35 U.S.C. 103(a) as being unpatentable over USPN 5,699,507

to Goodnow, II et al., in view of USPN 5,574,837 to Clark et al.

Per claim 34:

Goodnow failed to explicitly disclose:

-determining a group of clusters;

-comparing each of the interval vectors to each of the set of clusters;

-adding the compared interval vector to a particular cluster based on a goodness of fit between

the compared basic block vectors and each of the group of clusters;

-changing a centroid of each of the group of clusters; repeating the comparing, adding, and

clustering steps to form the set of clusters.

However Clark more explicitly disclosed 'generating a browser interface for representing

similarities between segments of code'. Col. 2: 25-29, "The statistical extractor 110 extracts

predefined data attributes from each code segment..." Col. 2, lines 34-37, "A distance matrix

generator 115 receives the statistics from statistical extractor 110 and identifies similarities

between the segments of code as a function of a weighting scheme..." Col. 2: 41-44, "scan the

segments of code and select a specific weighting scheme based on criteria which defines the

segments...Cluster tree generator 120 generates cluster trees based on the generated distance

matrices"

Therefore, it would have been obvious, to one of ordinary skill in the art, at the time of the

invention to modify Goodnow, using the teachings of Clark which include statistical functions

performed on matrix data, because the Goodnow patent references the Clark patent (Goodnow:

col. 13: 14-17). Both references disclose cluster interfaces representing similarities in segments

of code.

16.   Claims 18-21, 41, 49, 51, and 53 are rejected under 35 U.S.C. 103(a) as being

unpatentable over USPN 5,699,507 to Goodnow, II et al., in view of USPN 5,574,837 to Clark et

al., and further in view of USPN 5,953,006 to Baker et al.

Per claims 18 & 19:

Regarding the following limitations:

-minimizing the number of clusters.

Goodnow: Col. 2: 49-63, "A distance matrix generator 115 receives the information from the

statistical generator 110 and identifies similarities between the segments of code as a function of

a weighing scheme...the weighing scheme may be determined by a number of means, e.g.,

interaction with a user of the system 100 or application programs which scan the code segments

and select a specific weighing scheme based on criteria which defines the segments...An

interface generator 120 generates an interface such as…a cluster interface or dot plot matrix,

which is based on the generated distance matrices.

Goodnow disclosed creating clusters using various weights & statistics, but failed to explicitly

disclose minimizing the numbers of clusters.

Clark disclosed additional details related to using weights to emphasize statistical functions :

Col. 5: 40-63, "The distance functions are used to construct the cluster interface. FIG. 5 shows a

display 500 which illustrates a cluster interface generated…maps the similarities…based on

certain predefined constraints…The constraints are generally defined in terms of a weighting

scheme which may be selected by the user to generate the cluster interface…The weights may

place additional emphasis on certain structural features…used to emphasize certain functions…"

However, Baker more explicitly disclosed (col. 9: 6-14 & 35-44), compression and filtering to

compress for storage of filter in the case of too many dots shown in a dot plot. Also see col. 4:

45-67 which discusses a dot plot views and a magnified view (using no compression).

Therefore, it would have been obvious, to one of ordinary skill in the art, at the time of the

invention to modify Goodnow / Clark by including the more specific details related to filtering

techniques related to compression, as disclosed by Baker because the Goodnow patent references

the Clark patent (Goodnow: col. 13: 14-17) and the Clark patent, incorporates by reference the

Baker patent (Clark: col. 3: 20-24). All references disclose cluster interfaces representing

similarities in segments of code.

Per claims 20 & 21:

-weighing each of the selected representative intervals of execution based on at least one of a

total amount of time, a number of instructions within the cluster, the program component, and

the statistic;

-wherein the weighted representative intervals collectively represent a complete execution of at

least a subset of the computer program; and further comprising minimizing the number of

clusters.

Goodnow: Col. 13: 17-36.

Goodnow failed to disclose 'minimizing.' See rejection of claims 18 and 19 above.

Therefore, it would have been obvious, to one of ordinary skill in the art, at the time of the

invention to modify Goodnow / Clark by including the more specific details related to filtering

techniques related to compression, as disclosed by Baker because the Goodnow patent references

the Clark patent (Goodnow: col. 13: 14-17) and the Clark patent, incorporates by reference the

Baker patent (Clark: col. 3: 20-24). All references disclose cluster interfaces representing

similarities in segments of code.

Per claim 41:

-reducing a number of the identified sections of code to a lower number of buckets.

See rejection of claims 18 & 19 as related to minimizing / reducing.

Therefore, it would have been obvious, to one of ordinary skill in the art, at the time of the

invention to modify Goodnow / Clark by including the more specific details related to filtering

techniques related to compression, as disclosed by Baker because the Goodnow patent references

the Clark patent (Goodnow: col. 13: 14-17) and the Clark patent, incorporates by reference the

Baker patent (Clark: col. 3: 20-24). All references disclose cluster interfaces representing

similarities in segments of code.

Per claim 49:

-if a storage area for storing the phase ID, behavior, and statistic is finite, only a single stored

signature for a phase ID, and the phase ID, are stored.

See rejection of claims 18 & 19 as related to optimizing storage.

Therefore, it would have been obvious, to one of ordinary skill in the art, at the time of the

invention to modify Goodnow / Clark by including the more specific details related to filtering

techniques related to compression, as disclosed by Baker because the Goodnow patent references

the Clark patent (Goodnow: col. 13: 14-17) and the Clark patent, incorporates by reference the

Baker patent (Clark: col. 3: 20-24). All references disclose cluster interfaces representing

similarities in segments of code.

Per claim 51:

-using the found associated statistic, performing at least one of a behavior optimization, statistic

optimization, load-time optimization, run-time optimization, and hardware reconfiguration.

See rejection of claims 18 & 19 as related to optimizing.

Therefore, it would have been obvious, to one of ordinary skill in the art, at the time of the

invention to modify Goodnow / Clark by including the more specific details related to filtering

techniques related to compression, as disclosed by Baker because the Goodnow patent references

the Clark patent (Goodnow: col. 13: 14-17) and the Clark patent, incorporates by reference the

Baker patent (Clark: col. 3: 20-24). All references disclose cluster interfaces representing

similarities in segments of code.

Per claim 53:

Regarding the limitations:

-retrieving information for the predicted phase ID;

-using the retrieved information, guiding optimization for the computer program.

Goodnow provided for (col. 2: 65-66) "metrics which include both static and dynamic

characteristics are considered in identifying similarities in two or more code segments" using a

dot plot matrix or cluster interface.

Goodnow failed to explicitly disclose optimization. See rejection of claims 18 & 19 as related to

optimizing.

Therefore, it would have been obvious, to one of ordinary skill in the art, at the time of the

invention to modify Goodnow / Clark by including the more specific details related to filtering

techniques related to compression, as disclosed by Baker because the Goodnow patent references

the Clark patent (Goodnow: col. 13: 14-17) and the Clark patent, incorporates by reference the

Baker patent (Clark: col. 3: 20-24). All references disclose cluster interfaces representing

similarities in segments of code.

Conclusion

17.   The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Mary Steelman, whose telephone number is (571) 272-3704. The examiner can normally be reached Monday through Thursday, from 7:00 AM to 5:30 PM If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wei Zhen can be reached at (571) 272-3708. The fax phone number for the organization where this application or proceeding is assigned: 571-273-8300.

Any inquiry of a general nature or relating to the status of this application should be directed to the TC 2100 Group receptionist: 571-272-2100.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Mary Steelman

07/20/2006